

WHAT IS CLAIMED IS:

1. A capacitance detecting proximity sensor that includes a sensor structure and a sensor circuit and electrostatically
5 detects when a detection subject has come into proximity within a difference threshold, wherein

the sensor structure houses a first detection electrode and a second detection electrode that are disposed in mutual proximity in a predetermined geometrical relationship and are
10 mutually electrically independent,

the environment in which the first detection electrode and the second detection electrode are disposed in the sensor structure is differentiated and configured so that when the detection subject is present in the vicinity of the difference
15 threshold, the electrostatic environmental condition between the detection subject and the first detection electrode and the electrostatic environmental condition between the same detection subject and the second detection electrode are different, and

20 the sensor circuit detects and outputs the difference between a capacitance to ground formed by the first detection electrode and a capacitance to ground formed by the second detection electrode.

25 2. The capacitance detecting proximity sensor of claim 1, wherein a shield electrode is disposed in the sensor structure so as to surround another portion of the difference threshold

vicinity excluding a front side portion of the difference threshold vicinity facing the detection subject, and the first detection electrode and the second detection electrode are electrostatically shielded by the shield electrode excluding the front direction.

3. The capacitance detecting proximity sensor of claim 1 or 2, wherein the environment in which the first detection electrode and the second detection electrode are disposed in the sensor structure is differentiated so that the spatial distance between the detection subject in the vicinity of the difference threshold and the first detection electrode and the spatial distance between the same detection subject and the second detection electrode are different.

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4. The capacitance detecting proximity sensor of claim 1 or 2, wherein the dielectric constants of a first dielectric disposed at the front side of the first detection electrode facing the detection subject and a second dielectric disposed at the front side of the second detection electrode facing the detection subject are made different, whereby the environment in which the first detection electrode and the second detection electrode are disposed in the sensor structure is differentiated.

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5. The capacitance detecting proximity sensor of claim 1 or 2, wherein the second detection electrode is disposed

opposite from the front side of the first detection electrode facing the detection subject so that the second detection electrode is hidden from the difference threshold vicinity at a rear portion of the first detection electrode, whereby
5 the environment in which the first detection electrode and the second detection electrode are disposed in the sensor structure is differentiated.

6. The capacitance detecting proximity sensor of any of
10 claims 1 to 5, wherein the first detection electrode, the second detection electrode and the sensor structure are configured in band-like shapes.

7. The capacitance detecting proximity sensor of claim 6,
15 wherein the shield electrode is formed in a rail shape having a substantially U-shaped cross section, with the first detection electrode and the second detection electrode being housed inside the U-shaped groove.

20 8. The capacitance detecting proximity sensor of claim 7, wherein the shield electrode comprises a rail-shaped insulation retention member having a substantially U-shaped cross section and metal foil disposed on the outer side of the U-shaped cross section.

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9. The capacitance detecting proximity sensor of claim 6 or 7, wherein the first detection electrode and the second

detection electrode are band-like conductors formed in comb-like shapes having teeth and disposed so that when the sensor structure is seen from the front side, the comb-like teeth alternately mesh together.

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10. The capacitance detecting proximity sensor of claim 6 or 7, wherein the first detection electrode and the second detection electrode are plurally divided, with the shield electrode individually surrounding the divided electrodes.

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11. The capacitance detecting proximity sensor of any of claims 1 to 10, wherein the sensor circuit includes a first capacitance detection circuit that measures the capacitance to ground of the first detection electrode, a second capacitance
15 detection circuit that measures the capacitance to ground of the second detection electrode, and a difference detection circuit that outputs the difference between the measured outputs of these two capacitance detection circuits.

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12. The capacitance detecting proximity sensor of claim 11, wherein the first and second capacitance detection circuits are switched capacitor-type capacitance detection circuits.